Math
Algebra I

PLD	Standard	Minimally Proficient	Partially Proficient	Proficient	Highly Proficient
		The Minimally Proficient student	The Partially Proficient student	The Proficient student	The Highly Proficient student
Number and Quantity					
Detailed	N-RN.B [3]	Explains why adding and multiplying two rational numbers results in a rational number	Explains why adding a rational number to an irrational number results in an irrational number	Explains why multiplying a nonzero number to an irrational number results in an irrational number.	Generalizes and develops rules for sum and product properties of rational and irrational numbers.
Algebra					
Detailed	A-SSE.A [1a to 1b]	Identifies some of the basic terms (base, exponent, coefficient, and factor) of a linear or exponential expression.	Identifies all of the basic terms (base, exponent, coefficient, and factor) of linear and exponential expressions.	Interprets complicated expressions by viewing one or more of their parts as a single entity.	Explains the context of different parts of a formula presented as a complicated expression.
Detailed	A-SSE.A [2]	Can identify different forms for the same expression.	Justifies the different forms based on mathematical properties.	Recognizes equivalent forms of numerical and polynomial expressions in one variable and uses the structure of the expression to identify ways to rewrite it.	Rewrites numerical and polynomial expressions to equivalent forms, using the structure of the expression. Interprets different symbolic notation. Makes generalizations by rewriting expressions in context, using their structure.
Detailed	A-SSE.B [3a]	Identifies the zeroes of	Factors a quadratic	Factors a quadratic	Explains conditions for

		a quadratic expression written in factored form.	expression without a leading coefficient.	expression to reveal the zeroes of the function it defines.	two, one, and no real roots.
Detailed	A-SSE.B [3b]	Identifies the maximum or minimum of a function, using the graph.	Identifies the maximum or minimum of a function when given in vertex form.	Completes the square in a quadratic expression to reveal the maximum or minimum value of the function it defines.	Completes the square in a quadratic expression (where b is not divisible by two).
Detailed	A-SSE.B [3c]	Knows the properties of exponents	Applies the properties of exponents.	Uses the properties of exponents to transform expressions for exponential functions with integer exponents modeling a real-world context.	Interprets properties of exponential functions by transforming them into equivalent expressions that reveal properties within a context.
Detailed	A-APR.A [1]	Identifies polynomial expressions.	Adds, subtracts, and multiplies polynomials.	Understands that polynomials are closed under the operations of addition, subtraction, and multiplication.	Creates equivalent polynomial expressions using the fact that polynomials are closed under the four operations.
Detailed	A-APR.B [3]	Identifies the zeros of a quadratic function from a graph.	Use zeros to sketch the graph of a quadratic function given in factored form.	Factor a quadratic function and use zeroes to sketch a graph of the function.	Identify zeros from the graph and use zeroes to construct the quadratic function.
Detailed	A-CED.A [1 and 4]; A-REI.B [3]	Distinguishes between linear equations, inequalities, and non-linear equations.	Solves linear equations and inequalities in one variable with constant coefficients.	Creates and solves linear equations and inequalities in one variable, including equations with coefficients represented	Creates, rearranges, and solves exponential equations with integer exponents or quadratic equations.

				by letters to solve problems with a real world context. Rearranges formulas to highlight a quantity of interest, using the same reasoning as in solving equations.	
Detailed	A-CED.A [2]; A-REI.D [12]	Writes and graphs an equation to represent a linear relationship. Identifies a solution region when the graph of a linear inequality is given.	Writes and graphs an equation to represent an exponential relationship. Graphs the solutions to a linear inequality in two variables as a half-plane.	Constructs equations and graphs that model linear and exponential relationships (with context). Graphs solutions of the system of inequalities and identifies the solution set as a region of the coordinate plane that satisfies both inequalities.	Compares and contrasts equations and graphs that model linear and exponential relationships. Writes or creates a system of linear inequalities given a context or graph and identifies the solution set as a region of the coordinate plane that satisfies all inequalities.
Detailed	A-CED.A [3]	Determines whether a point is a solution to a system of equations and/or inequalities given a graph or equations.	Interprets solutions as viable or non-viable options in a modeling context where constraints are presented verbally.	Represents constraints by equations or inequalities, and by systems of equations and/or inequalities.	Defends and justifies solutions or non-solutions in a modeling context.
Detailed	A-REI.A [1]	Solves a quadratic equation with multiple steps, without justifying the steps involved in solving.	Describes the steps in solving quadratic equations.	Explains and justifies the steps in solving linear equations by applying the properties of equality, inverse, and identity.	Explains and justifies the steps in solving linear and quadratic equations by applying and naming the properties of equality, inverse, and

					identity.
Detailed	A-REI.B. [4a to 4b]	Solves quadratic equations with real solutions by simple inspection.	Solves quadratic equations by factoring.	Solves quadratic equations with real solutions by inspection (e.g., for $x^2 = 49$)-- taking square roots, completing the square, the quadratic formula, and factoring-- as appropriate to the initial form of the equation.	Determines the most efficient method for solving a quadratic equation and justifies the choice selected. Recognize cases in which a quadratic equation has no real solutions.
Detailed	A-REI.C [5 to 6]	Explains the use of the multiplication property of equality to solve a system of equations. Solves a system of linear equations approximately when given a graph of the system.	Explains why the sum of two equations is justifiable in the solving of a system of equations. Tests a solution to the system in both original equations (both graphically and algebraically).	Relates the process of linear combinations with the process of substitution for solving a system of linear equations. Solves a system of linear equations exactly and approximately by choosing the best method depending on the representation of the equations	Proves that, given a system of two equations in two variables, replacing one equation by the sum of that equation and a multiple of the other produces a system with the same solutions. Analyzes the system of equations and is able to solve exactly and approximately given a context or real-world situation. Solves a system of equations and manipulates one of the equations to provide additional information or an additional given solution.
Detailed	A-REI.D [10 to 11]	Identifies solutions and	Identifies solutions and	Graphs points that	Describes viable

		non-solutions of linear equations in two variables. Finds the point where two lines or exponential curves intersect on a graph or approximates solutions using other methods such as a table or technology.	non-solutions of exponential equations in two variables. Finds and explains why the solution to a system linear, polynomial, rational, or absolute value equations is the point where the two intersect.	satisfy linear and exponential equations. Models the solutions of a system of linear equations and/or exponential equations showing the solutions using technology, tables, graphs, approximations. Finding the solutions approximately is limited to cases where f(x) and g(x) are polynomial functions.	solutions using the knowledge that continuous lines and curves contain an infinite number of solutions. Explains why there are infinitely many solutions when f(x) = g(x) .

Functions					
Detailed	F-IF.A [1 to 2]; F-IF.B [5]	Identifies functions and their domains	Evaluates a function for inputs in the domain, and writes functions using function notation (without context).	Uses function notation and evaluates functions for inputs in their domain, and interprets statements that use function notation in terms of context.	Applies and extends knowledge of domain and range to real world situations and contexts; creates a function for a given context where the domain meets given parameters.
Detailed	F-IF.B [4]	Identifies the key features (as listed in the Standard) when given a linear, quadratic, square root, cube root, piecewise-defined functions (including step functions and absolute value functions), and exponential functions (with domains in the integers).	Interprets the key features (as listed in the Standard) when given a graph of a linear, quadratic, square root, cube root, piecewise-defined functions (including step functions and absolute value functions), and exponential functions (with domains in the integers).	Identifies and interprets the key features (as listed in the Standard) when given a table of values. Sketches graphs of linear, quadratic, square root, cube root, piecewise-defined functions (including step functions and absolute value functions), and exponential functions (with domains in the integers) showing key features, when given a verbal description of the relationship.	Accurately creates a story or context that models the given key features of linear, quadratic, square root, cube root, piecewise-defined functions (including step functions and absolute value functions), and exponential functions (with domains in the integers).
Detailed	F-IF.B [6]	Determines the rate of change of a linear function presented algebraically.	Determines the rate of change of an exponential function presented algebraically, over a given interval.	Calculates and interprets the average rate of change of a function presented symbolically or as a table over a specified	Describes the different rates of change over given intervals of the graph .

				interval.	
Detailed	F-IF.C [7a to 7b, and 8a]	Evaluates linear, quadratic, piecewise, step, and absolute value functions	Identifies key features of linear, quadratic, piecewise, step, and absolute value functions when the graph is given.	Graphs linear, quadratic, piecewise, step, and absolute value functions, showing intercepts, maxima, and minima. Can graph functions expressed symbolically and can show key features of the graph (by hand in simple cases, and using technology for more complicated cases).	Graphs and compares linear, quadratic, piecewise, step, and absolute value functions in various forms.
Detailed	F-IF.C [9]	Compares slopes and y-intercepts of two linear functions where one is presented graphically and the other is presented in slope-intercept form.	Compares growth rates and intercepts of two functions where one is presented graphically and the other is presented in function notation.	Uses tables, graphs, algebra, and verbal descriptions to compare properties of two functions (linear, quadratic, square root, cube root, piecewise-defined functions (including step functions and absolute value functions), and exponential functions with domains in the integers), when each is presented a different way.	Constructs a linear, quadratic, square root, cube root, piecewise-defined functions (including step functions and absolute value functions), and exponential functions with domains in the integers that has a characteristic (i.e. slope, intercept, maximum) that is greater than or lesser than a given function.
Detailed	F-BF.A [1]; F-IF.A [3]; F-LE.A [2]	Identifies the parts of a recursive function or sequence.	Defines and expresses a recursive sequence as a function, constructs a	Recognizes that sequences are functions with a domain that is a	Applies sequences, sometimes expressed as recursive functions,

			linear function (not multi-step) given a graph, a description of a relationship, or two input-output pairs.	subset of the integers, can generate a recursive function to express a sequence and generate a sequence given a recursive function, constructs an exponential function (not multi-step) given a graph, a description of a relationship, or two input-output pairs.	to real world contexts.
Detailed	F-BF.B [3]	Relates the vertical translation of a linear function to its y-intercept.	Performs vertical translations on linear, quadratic, square root, cube root, piecewise-defined functions (including step functions and absolute value functions), and exponential functions with domains in the integers.	Performs vertical translations on graphs. Describes what will happen to a function when f(x) is replaced by f(x) + k, k f(x), f(kx), and f(x+k) for different values of k.	Finds the value of k given f(x) replaced by f(x) + k, k f(x), f(kx), and f(x+k) on a graph of linear, quadratic, square root, cube root, piecewise-defined functions (including step functions and absolute value functions), and exponential functions with domains in the integers.
Detailed	F-LE.A [1a to 1c]	Recognizes situations in which one quantity changes at a constant rate per unit interval relative to another.	Recognizes relationships in tables and graphs that can be modeled with linear functions (constant rate of change) and with exponential functions (multiplicative rate of	Justifies that linear functions grow by equal differences over equal intervals; exponential functions grow by equal factors over equal intervals. (ex- percent change)	Describes the rate of change per unit as constant or the growth factor as a constant percentage. Proves that linear functions grow by equal differences over equal intervals;

			change)		exponential functions grow by equal factors over equal intervals.
Detailed	F-LE.A [3]	Compares the values of linear and exponential functions at specific points.	Compares the values of linear and exponential functions over various intervals.	Observes, using graphs and tables, that a quantity increasing exponentially eventually exceeds a quantity that is increasing linearly or quadratically.	Observes, explores, predicts, models, and evaluates different situations in which linear and exponential functions are compared.
Detailed	F-LE.B [5]	Identifies which values are constant from a given context.	Interprets the slope and x-and y- intercepts in a linear function in terms of a context.	Interprets the base value and vertical shifts in an exponential function of the form $f(x) = b^x + k$, where b is an integer and k can equal zero, in terms of context.	Interprets the base value and initial value in an exponential function of the form $f(x) = a*b^x$, where b is an integer, and a can be any positive integer including 1, in terms of context.

Statistics					
Detailed	S-ID.A [1]	Identifies dot plots, histograms, and box plots for a given set of data.	Graphs numerical data on a real number line using dot plots, histograms, and box plots.	Describes and gives a simple interpretation of a graphical representation of data on dot plots, histograms, and box plots.	Determines and justifies which type of data plot on a real number line would be most appropriate for a set of data. Identify advantages and disadvantages of different types of data plots.
Detailed	S-ID.A [2 to 3]	Describes informally the center and spread of a single set of data or graph. Identifies shape, center, and spread of a data set.	Compares informally the similarities or differences in shape, center, or spread between two graphs. Identifies and states the effects of existing outliers.	Explains and interprets similarities and differences using specific measures of center and spread, given two sets of data or two graphs with possible effects from existing outliers.	Plots data based on situations with multiple data sets, and then compares and discusses using measures of center and spread and explores the manipulation of additional data points.. Justifies which measure(s) are most appropriate for comparison. Identifies advantages and disadvantages of using each measure of center and spread.
Detailed	S-ID.B [5]	Explains data in a two-way frequency table.	Creates a two-way frequency table showing the relationship between two categorical	Finds and interprets joint, marginal and conditional relative frequencies. Recognizes possible	Given a context, interprets, identifies, and describes associations and trends using a two-

			variables.	associations and trends in the data.	way frequency table.
Detailed	S-ID.B [6a to 6c]	Creates a scatter plot of bivariate data.	Determines if a plotted data set is approximately linear.	Creates a scatter plot of bivariate data and estimates a linear function that fits the data. Uses this function to solve problems in the context of the data.	Compares the fit of different functions, including exponential functions with domains in the integers, to data and determines which function has the best fit.
Detailed	S-ID.C [7]	Identifies a linear model of bivariate data.	Graphs data in a scatter plot, identify the slope and y- intercept of a linear model.	Using a line fitted to data, interprets the slope (rate of change) and the intercept (constant term) of a linear model in the context of the situation and data.	Using a function that best fits the data, interpolates and extrapolates trends in the data.
Detailed	S-ID.C [8 to 9]	Uses a table or graph of a set of data to informally describe a correlation. Defines causation and correlation.	Identifies the existence of or non-existence of causation in the context of a correlated problem. Computes the correlation coefficient of a set of linearly- related data using technology.	Interprets the correlation coefficient of a linear fit in the context of a situation using technology. Determines whether the correlation shows a weak positive, strong positive, weak negative, strong negative, or no correlation. Distinguishes between causation and correlation in the context of a situation with data.	Supports or refutes a hypothesized correlation between two sets of data. Supports or refutes claims of causation with the understanding that a strong correlation does not imply causation.